Remarks

Claims 1-5 and 10-16 are pending in the application. Claims 6-9 have been cancelled. Claims 12-16 are new.

Claim Rejections – 35 USC § 102

Claims 1, 4, 5, 10 and 11 have been rejected as allegedly being anticipated by Baraldi. In response to this rejection, claim 1 has been amended so as to incorporate the content of former claims 6-9, namely a first brew temperature of between 20°C and 65°C, and a second brew temperature of between 65°C and 90°C. Baraldi disclosing a method using a single temperature for extracting catechins, it is therefore submitted that claim as amended, as well as claims 1, 4, 5, 10, and 11, are not anticipated by Baraldi.

Claims 1, 2, 4, 5, 8, 10, and 11 have been rejected by the Examiner as allegedly being anticipated by Mishkin *et al.* The amendment of parent claim 1 presented above is also believed by the Applicant to overcome this rejection. Since Mishkin *et al.* only discloses an elevated temperature of extraction (e.g. 110°C), it is therefore submitted that claim 1 as amended, as well as dependent claims 2, 4, 5, 8, 10, and 11, are not anticipated by Mishkin *et al.*

Claim Rejections – 35 USC § 103

Claims 6, 7, 8, and 9 have been rejected by the Examiner as allegedly being obvious over Baraldi. Despite the fact that the cancellation of claims 6-9 render this rejection moot, the Applicant wishes to address the issue of alleged obviousness of the present invention over Baraldi.

The objective of Baraldi is to produce an extract of *Ceratoizia siliqua* leaves and pod containing a high concentration of polyphenols. Baraldi aims at obtaining the highest yield of polyphenols from his method. While he teaches that a second extraction may be performed ("a second aqueous extract is optionally obtained by further infusing the centrifugation residue", paragraph [0014]), this second extraction only serves the purpose of increasing the polyphenols yield, as the same conditions for both extractions are to be used. Moreover,

despite not mentioning the temperature of the water used for extraction, Baraldi mentions that hot water is to be used, which usually correspond to a temperature of about 80°C.

An aspect of the present invention as claimed is a selective and sequential extraction of at least two catechins comprising a first brewing step at a low temperature to allow extraction of EGC, followed by a second brewing step at a higher temperature for extracting EGCG. The temperature of the first brewing step is optimized to allow the extraction of a high proportion of EGC and a lower concentration of EGCG, while the second brewing step is optimized to favor the extraction of a high proportion of EGCG, while an important proportion of EGC has already been extracted by the first brewing step. The differential effect of the two brewing temperatures on catechins extraction is described and exemplified in the description of the present application, as well as in the two additional references by Labbé *et al.* (Separation and Purification Technology 49 (2006) 1-9; see Figure 1 and Figure 5) and Bazinet *et al.* (Separation and Purification Technology 56 (2007) 53-56; see Figure 1 and Figure 2) herein attached. Baraldi only using a single temperature, it is therefore submitted that no selective and sequential extraction of EGC and EGCG can occur from such a technique. The skilled man in the art would have therefore easily understood by reading Baraldi that the extraction method proposed by Baraldi allows for the extraction of <u>all</u> polyphenols at the same time, and that a <u>second extraction is suggested</u> in order to increase the polyphenols yield (see Table 1 of Baraldi where both EGC et EGCG are extracted similarly during both the infusions). Therefore, it is submitted that the present application is not obvious over Baraldi.

Claims 3, 6, and 7 have been rejected by the Examiner as allegedly being obvious over Mishkin *et al.* Reconsideration of the Examiner's rejection is respectfully requested based on the following grounds.

Mishkin teaches a process for preparing a tea extract to be used as an instant tea product, the process comprising two steps at two different temperatures, one not exceeding 110°C, and the second temperature being in excess of 180°C. Mishkin mentions on column 1, line 56-67, that his process addresses the production of instant tea powder at a good yield, with the tea powder having pleasant flavor, aroma, color, and texture. It is therefore clear that Mishkin never intended to selectively and sequentially extract two catechins from the tea

leaves. In fact, Mishkin discloses a first extraction at a temperature of "less than 110°C", which is exemplified all through the specification at about 105°C (see examples 1-3). Since the method disclosed by Mishkin uses percolating water, it would therefore have appeared to the skilled man in the art that the water temperature can not be below about 90°C, for the water to be percolating as taught by Mishkin. The second extraction disclosed by Mishkin is higher than the temperature used for the first extraction.

As shown in the previously mentioned references by Labbé *et al.* and Bazinet *et al.*, the solubility of EGC is temperature-independent, while the solubility of EGCG is temperature-dependent. Therefore, by performing a first extraction step at the temperature allowing for the EGCG to solubilize as taught by Mishkin, the method also allows the solubilization of EGC at the same time. It results that, as it was the case with the method disclosed by Baraldi, EGC and EGCG are extracted from tea leaves at the same time, in contrast with the selective and sequential extraction claimed in the present application.

Moreover, the Applicant would like to direct the Examiner's attention to the attached reference by Kilmartin and Hsu (Food Chemistry 82 (2003) 501-512), which describes the differences in the phenolic content of green tea versus black tea, particularly in Table 3. It is shown that EGC and EGCG concentration is much higher in green tea that it is in black tea. Since Mishkin *et al.* discloses a method for producing an instant tea product aiming at having the maximum flavor, aroma, color, and texture by extracting black tea leaves with percolating water, it is therefore submitted that the skilled man in the art would have found no direction nor suggestion in trying to selectively and sequentially extract two different catechins from a different tea product (i.e. green tea). Therefore, the removal of the rejection of claims 3, 6, and 7 as allegedly being obvious over Mishkin *et al.* is respectfully requested.

Prior Art

The Examiner mentions that the prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

On this point, the Applicant would like to mention that all of the five other prior art references made of record by the present office action are directed toward small volumes

production and analysis of plant extracts wherein no selective nor sequential extraction steps using two different temperature ranges are used. For example, in the reference by Chen et al., showing the effect of temperature on the yield of green tea phenols, extracted EGC and EGCG concentrations are shown to be constant at all the temperature tested (see Table 4, page 1037). It is therefore respectfully submitted that these five prior art references made of record by the present office action are not pertinent to the present application for other purposes than a general description of the art.

Additional Remarks

New claims 12 and 13 have been added based on the support found in paragraph [0029].

New claims 14 to 16 have been added based on the support found in paragraphs [0046], [0047] and [0048].

No new matter has been introduced by way of the present amendment.

It is therefore submitted that the claims are in condition for allowance. Reconsideration of the Examiner's rejections is respectfully requested, and allowance of claims 1-5 and 10-16 on their merits and at an early date is earnestly solicited.

An information disclosure statement is enclosed herewith disclosing the references provided in the present response. Applicant wishes that these three references be made of record.

In the event that there are any questions concerning this amendment, or the application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of this application may be expedited.

No additional fees are believed to be required by the present response. However, should this be an error, the Commissioner is further authorized to charge any additional fees which may be required for underpayment, or to credit any overpayment, to Deposit Account # 19-5113.

Respectfully,

UNIVERSITE LAVAL

December 18, 2007
Date

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Encl: Information disclosure statement and 3 references